No. 200100175

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Minnesota Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR USING IT IN UCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY CTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A ERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF TH 84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'M-S2'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fifth day of February, in the year two thousand two.

Attest:

Paul M. John

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER
Minnesota Agricultural Experiment Station
University of Minnesota

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME
M92-1003

3. VARIETY NAME
M-S2

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
277 Coffey Hall
1420 Eckles Avenue
St. Paul, MN 55108

5. TELEPHONE *(include area code)*
612-625-4211

6. FAX *(include area code)*
612-624-7724

FOR OFFICE USE ONLY
PVPO NUMBER 200100175
FILING DATE 4/13/2001

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
University

8. IF INCORPORATED, GIVE STATE OF INCORPORATION

9. DATE OF INCORPORATION

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*
J.H. Orf
Department of Agronomy and Plant Genetics
University of Minnesota
1991 Upper Buford Circle
411 Borlaug Hall
St. Paul, MN 55108-6026

FILING AND EXAMINATION FEES:
$ 2705.00
DATE 4/13/2001

CERTIFICATION FEE:
$ 320
DATE 1/17/02

11. TELEPHONE *(include area code)*
612-625-8275

12. FAX *(include area code)*
612-625-1268

13. E-MAIL
orfxx001@tc.umn.edu

14. CROP KIND *(Common Name)*
Soybean

15. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)

a. [X] Exhibit A. Origin and Breeding History of the Variety
b. [X] Exhibit B. Statement of Distinctness
c. [X] Exhibit C. Objective Description of Variety
d. [ ] Exhibit D. Additional Description of the Variety *(Optional)*
e. [X] Exhibit E. Statement of the Basis of the Owner's Ownership
f. [X] Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
g. [X] Filing and Examination Fee ($2,705), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

16. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *See Section 83(a) of the Plant Variety Protection Act)*
[X] YES *(If "yes", answer items 20 and 21 below)* [ ] NO *(If "no," go to item 22)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? [X] YES [ ] NO
IF YES, WHICH CLASSES? [X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

21. DOES THE OWNER SPECIFY THAT THE CLASSES BE LIMITED AS TO NUMBER OF GENERATIONS? [X] YES [ ] NO
IF YES, SPECIFY THE NUMBER 1, 2, 3, etc. 10 FOUNDATION ____ REGISTERED 1 CERTIFIED
(If additional explanation is necessary, please use the space indicated on the reverse.)

22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?
[ ] YES [X] NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
[ ] YES [X] NO
IF YES, GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER
Beverly R. Durgan

NAME *(Please print or type)*
Beverly R. Durgan

CAPACITY OR TITLE
Associate Dean

DATE
5/9/01

SIGNATURE OF OWNER

NAME *(Please print or type)*

CAPACITY OR TITLE

DATE

Exhibit A

Origin and Breeding History of M-S2 Soybean

'M-S2' soybean traces to the F_4 progeny of an F_3 plant harvested from a population that had been advanced by a modified single seed descent procedure from the cross Minnatto x Kingnatto. Bulked seed of the F_4 row was designated M92-1003. The bulked F_4 seed of M92-1003 was used for yield testing in the F_5 (1993). Subsequent tests of strain M92-1003 were conducted in Minnesota in the F_6 (1994) through F_{12} (through 2000). In the F_{10} generation 50 typical plants were harvested individually to initiate purification for observable traits including reaction to race 1 of phytophthora. In 1999 thirty rows were grown for purification purposes. After observations in the field and testing in the greenhouse for resistance to race 1 of phytophthora, eighteen rows were bulked to provide breeder seed. In the F_{12} (2000) a small increase of breeder seed was made. In November 2000 M92-1003 was approved for release and licensing as M-S2. No off types were noted in the seed multiplication process of M-S2. This variety breeds true and meets certification standards.

Exhibit B

Statement of Distinctiveness

'M-S2' soybean is most similar to Minnatto soybean. M-S2 is approximately four days later in maturity than Minnatto. The yield of M-S2 is about 3% greater than Minnatto. M-S2 has a poorer lodging score than Minnatto (2.8 vs 2.1). M-S2 is about seven inches taller than Minnatto. Seed of M-S2 is about 0.8 grams per 100 seed smaller than Minnatto. M-S2 has about 0.6 percent higher protein content and 0.1 percent lower oil content compared to Minnatto. Seed of both M-S2 and Minnatto have yellow hila. M-S2 has tan pods while Minnatto has brown pods. Both M-S2 and Minnatto have white flowers and gray pubescence. M-S2 has resistance to race 1 of the phytophthora while Minnatto is ~~susceptible.~~ resistant (corrected per written correspondence received from applicant on July 11, 2002).

Data comparing M-S2 is taken from Minnesota tests 1995-2000 (a total of 11 tests for most traits).

Variety	Date Mature	Yield bu/A	Height (inches)	Lodging Score	Seed Size g/100	Protein %	Oil %
M-S2	9/20	31.5	38	2.8	8.7	38.0	16.0
Minnatto	9/16	30.5	31	2.1	9.5	37.4	16.1

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY
SOYBEAN (*Glycine max* (L.) Merr.)

NAME OF APPLICANT(S)	FOR OFFICIAL USE ONLY
Minnesota Agricultural Experiment Station-University of Minnesota	PVPO NUMBER 200100175
ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)	VARIETY NAME
277 Coffey Hall 1420 Eckles Ave. St. Paul, MN 55108	M-S2
	TEMPORARY OR EXPERIMENTAL DESIGNATION
	M92-1003

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below.

Place a zero in the first box (e.g [9][9][9] **or** [0][9] **) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used:**

Please answer all questions for your variety; lack of response may delay progress of your application.

A. MORPHOLOGY

Seed Shape:

[1]

1 = Spherical (L/W, L/T, and T/W ratios < 1.2)
2 = Spherical-Flattened (L/W ratio > 1.2; L/T ratio < 1.2)
3 = Elongate (L/T ratio > 1.2; T/W ratio < 1.2)
4 = Elongate-Flattened (L/T ratio > 1.2;T/W ratio > 1.2)

Seed Coat Color:

[1]

1 = Yellow **2 = Green** **3 = Brown** **4 = Black** **5 = Other (*Please Specify*)** _____

Seed Coat Luster:

[1]

1 = Dull **2 = Shiny**

Seed Size:

[0][8] **grams/100 seeds**

Hilum Color:

[2]

1 = Buff **2 = Yellow** **3 = Brown** **4 = Gray** **5 = Imperfect Black**
6 = Black **7 = Other (*Please Specify*)** _____

A. MORPHOLOGY (*Continued*)

200100175

Cotyledon Color:

[1] 1 = Yellow 2 = Green

Seed Protein Peroxidase Activity:

[1] 1 = Low 2 = High

Hypocotyl Color:

[1] 1 = Green ('Evans' or 'Davis') 2 = Green with Bronze Bands below Cotyledon ('Woodworth' or 'Tracy') 3 = Light Purple below Cotyledons ('Beeson' or 'Pickett 71') 4 = Dark Purple extending to unifoliolate leaves ('Hodgson', 'Coker', or 'Hampton 266A')

Leaf Shape:

[3] 1 = Lanceolate 2 = Oval 3 = Ovate 4 = Other (*Please Specify*) _____

Flower Color:

[1] 1 = White 2 = Purple 3 = White with a Purple Throat

Pod Color:

[1] 1 = Tan 2 = Brown 3 = Black

Pubescence Color:

[1] 1 = Gray 2 = Brown (Tawny) 3 = Light Tawny

Plant Habit:

[3] 1 = Determinate 2 = Semi - Determinate 3 = Indeterminate 4 = Intermediate

Maturity Group:

[0][4]

1 = 000 2 = 00 3 = 0 4 = I 5 = II
6 = III 7 = IV 8 = V 9 = VI 10 = VII
11 = VIII 12 = IX 13 = X 14 = XI 15 = XII

Maturity Subgroup:

[5] Please enter a value from 0 - 9

B. DISEASE REACTIONS 0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Tolerant

Bacterial

[0] Bacterial Pustule (*Xanthomonas campestris* pv. *glycines* (Nakano) Dye)

[0] Bacterial Blight (*Pseudomonas syringae* pv. *glycinea* (Coerper) Young, Dye, & Wilkie)

[0] Wildfire Blight (*Pseudomonas syringae* pv. *tabaci* (Wolf & Foster) Young, Dye, & Wilkie)

B. DISEASE REACTIONS (*Continued*) 0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Tolerant

Fungal

20010017

[0] Brown Spot (*Septoria glycines* Hemmi)

Frogeye Leaf Spot (*Cercospora sojina* Hara)

[0] race 1 [0] race 2 [0] race 3 [0] race 4

[0] race 5 [0] race 6 [ ] Other (*Please Specify*) _____

[0] Target Spot (*Corynespora cassiicola* (Berk. & Curt.) Wei)

[0] Downey Mildew (*Peronospora trifoliorum* var. *manchurica* (Naum.) Syd. ex Gäum)

[0] Powdery Mildew (*Microsphaera diffusa* Cke. & Pk.)

[0] Brown Stem Rot (*Phialophora gregata* (Allington & Chamberlain) W. Gams.)

[0] Stem Canker (*Diaporthe phaseolorum* (Cke. & Ell.) Sacc. var. *caulivora* Athow & Caldwell)

[0] Pod and Stem Blight (*Diaporthe phaseolorum* (Cke. & Ell.) Sacc. var. *sojae* (Lehman) Wehm.)

[0] Purple Seed Stain (*Cercospora kikuchii* (T. Matsu. & Tomoyasu) Gardener)

[0] Rhizoctonia Root Rot (*Rhizoctonia solani* Kühn)

Phytophthora Root Rot (*Phytophthora megasperma* Drechs. f. sp. *glycinea* (Kuan & Erwin))

[2] race 1	[0] race 8	[0] race 15	[0] race 22
[0] race 2	[0] race 9	[0] race 16	[0] race 23
[0] race 3	[0] race 10	[0] race 17	[0] race 24
[0] race 4	[0] race 11	[0] race 18	[0] race 25
[0] race 5	[0] race 12	[0] race 19	[0] race 26
[0] race 6	[0] race 13	[0] race 20	[ ] Other (*Please Specify*)
[0] race 7	[0] race 14	[0] race 21	_____

[0] Bud Blight (Tobacco Ringspot Virus)

[0] Yellow Mosaic (Bean Yellow Mosaic Virus)

6

B. DISEASE REACTIONS (*Continued*) 0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Tolerant

[0] Cowpea Mosaic (Cowpea Chlorotic Virus)

[0] Pod Mottle (Bean Pod Mottle Virus)

[0] Seed Mottle (Soybean Mosaic Virus)

20010017

Nematode

Soybean Cyst Nematode (*Heterodera glycines* Ichinohe)

[0] race 1
[0] race 2
[1] race 3
[0] race 4
[0] race 5
[0] race 6
[0] race 9
[0] race 14
[ ] Other (*Please Specify*) _____

[0] Lance Nematode (*Hoplolaimus columbus* Sher)

[0] Southern Root Knot Nematode (*Meloidogyne incognita* (Kofoid & White) Chitwood)

[0] Northern Root Knot Nematode (*Meloidogyne hapla* Chitwood)

[0] Peanut Root Knot Nematode (*Meloidogyne arenaria* (Neal) Chitwood)

[0] Reniform Nematode (*Rotylenchus reniformus* Linwood & Olivera)

[0] Javanese Nematode (*Meloidogyne javanica* (Treub) Chitwood)

[ ] Other Nematode (*Please Specify*) _____

C. PHYSIOLOGICAL RESPONSES 0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Tolerant

[1] Iron Chlorosis on Calcareous Soil

[0] Phosphorus

[ ] Other (*Please Specify*) _____

[0] Boron

[0] Aluminum

[0] Salt

[0] Drought

D. INSECT REACTIONS 0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Tolerant

[0] Mexican Bean Beetle (*Epilachna varivestis* Mulsant)

[0] Potato Leaf Hopper (*Empoasca fabae* (Harris))

[ ] Other (*Please Specify*) _____

E. HERBICIDE REACTIONS 0 = Not Tested 1 = Susceptible 2 = Resistant

[0] Metribuzin

[0] Bentazone

[0] Sulfonylurea

[1] Glyphosate

[0] Glufosinate

[0] Pendimethalin

[ ] Other (*Please Specify*) _____

F. TRANSGENIC COMPOSITION

Has the development of the subject variety included the insertion of genetic material from an organism other than a soybean, or, the removal of genetic material from the application variety?
If yes, please complete the following information requests*. Use additional pages if necessary. [ ] YES [X] NO

1. Please state the vector's name:
2. Please state the vector components:
3. Please describe the genetic material successfully transferred into the subject variety:
4. Please describe the insertion protocol:

* A literature citation(s) explaining the four information requests above may be an acceptable alternative to completion of the "Transgenic Composition" portion of this form.

G. BIOCHEMICAL MARKERS

Please describe any biochemical information here, which you believe will be helpful in further describing the subject variety (*e.g.* Simple Sequence Repeats, Restriction Fragment Length Polymorphisms, Isozymic Characterization). Use additional pages if necessary.

H. COMMENTS

REPRODUCE LOCALLY. *Include form number and edition date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)

Minnesota Agricultural Experiment Station
University of Minnesota

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

M92-1003

3. VARIETY NAME

M-S2

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*

277 Coffey Hall
1420 Eckles Avenue
St. Paul, MN 55108-6026

5. TELEPHONE *(include area code)*

612-625-4211

6. FAX *(include area code)*

612-624-7224

7. PVPO NUMBER 200100175

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* **If no, please explain.** [X] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? [X] YES [ ] NO
If no, give name of country

10. Is the applicant the original owner? [X] YES [ ] NO ***If no, please answer one of the following:***

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

[ ] YES [ ] NO **If no, give name of country**

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

[ ] YES [ ] NO **If no, give name of country**

11. Additional explanation on ownership *(if needed, use reverse for extra space)*:

The University of Minnesota is the employer of the breeder who developed M-S2.

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

STD-470-E (07-97) *(Destroy previous editions).*
Electronic version designed using WordPerfect InForms by USDA-AMS-IMB.